

87

Notice of Allowability

Application No.

10/043,772

Examiner

Chih-Ching Chow

Applicant(s)

KALOGEROPULOS, SPIROS

Art Unit

2192

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 2/14/05.
2. ☒ The allowed claim(s) is/are 1-32.
3. ☒ The drawings filed on 18 March 2002 are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).
 - * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date 5/7/2002
4. ☐ Examiner's Comment Regarding Requirement for Deposit
of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☒ Interview Summary (PTO-413),
Paper No./Mail Date 5/20/2002
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other


TUAN DAM
SUPERVISORY PATENT EXAMINER

Examiner's Amendment and Statement of Reasons for Allowance

1. This action is responsive to Applicant's amendment filed February 14, 2005.

Response to Arguments

2. Applicant's arguments, filed concurrently with the amendment after non-final filed on February 14, 2005, with respect to claims 1-32 have been fully considered and are persuasive. The rejection of these claims under 35 U.S.C. § 103 as being unpatentable over the combination of Brauch, Soltis, Subramanian, Emer, Fleck, Hayashi, and Lueh's disclosures is withdrawn.

Examiner's Amendment

3. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Mr. Serge Hodgson, Registration Number 40017, on May 20, 2005 for obviating any potential 101 issues and put the claims in condition for allowance.

The application has been amended as follows:

IN THE SPECIFICATION

1. The paragraph extending from page 18, line 33 to page 19, line 2 (paragraph 101) will be replaced with the following rewritten paragraph:

The present join instruction is now join instruction 306, which is the last join instruction. As discussed above, join instruction 306 is associated with basic block 108. Move instructions 702, 704 and instruction 118 (shown as instruction 706 in FIG. 9) follow join instruction 306 and are moved to basic block 108 as shown in FIG. 9.

IN THE CLAIMS

2. Claims 1, 5, 9, 20 and 29 are amended as following:

1. (Currently Amended) A method for a compiler using a computer system comprising:

building a trace comprising instructions that are stored in said computer system;

building a trace block comprising said instructions;

scheduling said instructions within said trace block disregarding data dependencies from any trace basic blocks, wherein at least one of said instructions is moved during said scheduling; and

correcting errors due to said at least one of said instructions being moved.

5. (Currently Amended) The method of Claim 4 wherein said correcting errors further comprises determining whether said instructions are mapped to the same join instructions of the said join instructions after said scheduling as the said instructions were mapped before said scheduling.

9. (Currently Amended) A method for a compiler using a computer system comprising:

building a trace comprising a first basic block and a second basic block, said first basic block comprising a first instruction that is stored in said computer system, said second basic block comprising a second instruction that is stored in said computer system;

building a trace block comprising said first instruction and said second instruction;

scheduling said first instruction and said second instruction within said trace block disregarding data dependencies from off trace basic blocks, wherein said second instruction is moved from said second basic block to said first basic block during said scheduling; and

correcting errors due to said second instruction being moved.

20. (Currently Amended) The system of Claim 19 wherein said correcting errors further comprises determining whether said instructions are mapped to the same join instructions of the said join instructions after said scheduling as the said instructions were mapped before said scheduling.

29. (Currently Amended) The computer program product of Claim 28 wherein said correcting errors further comprises determining whether said instructions are mapped to the same join instructions of the said join instructions after said scheduling as the said instructions were mapped before said scheduling.

Examiner's Statement of Reason(s) for Allowance

4. Claims 1-32 are allowed.

5. The following is an examiner's statement of reasons for allowance:

The prior arts of record: Brauch, teaches a method for software register renaming and optimizing program efficiency in a two-phase process. Soltis teaches a method of detecting data hazards within instruction groups; determining whether an instruction group includes an instruction defining a data hazard with another instruction of the same instruction group. Subramanian teaches a time reversed scheduling of a data dependency graph representing a target program instruction loop in an optimizing compiler. Emer teaches a technique for handling a conditional move instruction in an out-of-order data processor; generating multiple instructions according to the detected conditional move instruction. Fleck teaches an execution of a loop instructing in a loop pipeline after detection of a first occurrence of the loop instruction in an integer pipeline. Hayashi teaches a

compiling method that instructions are scheduled for an efficient parallel process with a register allotting process and an instruction scheduling process performed independently of each other. And Lueh teaches a method of compiling source code into native code, identifying a source code block in the source code to optimize using register promotion, and optimizing the source code block using a register promotion transformation. However, none of them, taken alone or in combination, teaches **disregarding data dependencies** for the initial scheduling, and **correcting errors for instruction movement due to the initial scheduling**, in such a manner as recited in each of independent claims 1, 9, 16, 24, and 25.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chih-Ching Chow whose telephone number is 571-272-3693. The examiner can normally be reached on 7:30am - 4:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tuan Dam can be reached on 571-272-3695. The fax phone


Art Unit: 2192

number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Chih-Ching Chow
Examiner
Art Unit 2192
Date: May 23, 2005

CC



TUAN DAM
SUPERVISORY PATENT EXAMINER